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FISHERY MANAGEMENT PLAN

Noxubee National Wildlife Refuge
Brooksville, MS

PREPARED BY:

John S. Foster — 8/14/88
Fisheries Biologist, OFA
Natchitoches, LA — Date

T. Anthony Mayeux — 8/16/88
Project Leader, OFA
Natchitoches, LA — Date

Jim Tisdale — 9/7/88
Project Leader
Noxubee National Wildlife Refuge
Brooksville, MS — Date

CONCURRENCE:

Don E Culbertson — 9/27/88
Fisheries Supervisor - III
USFWS, Region IV, Atlanta, GA — Date

L. Glen McBay (Acting) — 11-7-88
ARD - Fisheries
USFWS, Region IV, Atlanta, GA — Date

Sam D. Drake Jr. — 9/28/88
Refuge Supervisor - I
USFWS, Region IV, Atlanta, GA — Date

APPROVAL:

Harold W Bruce — 1/17/89
ARD - Wildlife Resources
USFWS, Region IV, Atlanta, GA — Date

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SUMMARY STATEMENT

Noxubee National Wildlife Refuge, established in 1940, is located in east central Mississippi in Winston, Oktibbeha, and Noxubee counties. The 47,000 acre refuge contains about 42,000 acres of timber, three green tree reservoirs, three major impoundments, the Noxubee River, plus various creeks and sloughs. The watershed is mostly forested and there is little agricultural acreage on the refuge. Millet, milo, corn, and wheat occupy less than 100 acres.

Predominant sport fishes occurring within waters of the refuge are largemouth bass, crappie, various sunfish, and catfish (blue, channel, and flathead). There are species (gar, catfish, buffalo, etc.) of commercial importance, but the demand for commercial fishing has been non-existant.

Fishery management responsibility was transferred to the Service from the State in 1979 when the U.S. Fish and Wildlife Service placed a fisheries biologist in the Jackson Area Office. Management efforts have been concentrated on Bluff Lake, 1000 acres; Loakfoma Lake, 600 acres; and Ross Branch, 30 acres. Currently, state fishing regulations are in effect on Bluff Lake, and 12 to 15 inch slot limits have been in place since 1979 on Loakfoma Lake and Ross Branch. Waterfowl management practices involve annual drawdowns by August 1st on Bluff and Loakfoma Lakes. The slot limits on Loakfoma Lake and Ross Branch are in place to encourage removal of excessive numbers of small bass, protect brood bass from approximately one to two pounds, and to allow the creeling of larger fish. Data necessary to implement and then monitor slot limits

is being obtained from electroshocking efforts. However, backup data from anglers is necessary as a supplement and this management plan proposes the use of an angler survey card. The card (Appendix I) polls bass length information on both creeled and released fish. This information is then used in a length-frequency distribution called Proportional Stock Density (PSD), an indicator of population structure. Management recommendations, including length and slot limits are based on PSD. The cards will be distributed to volunteer anglers or interested bass clubs.

The only endangered species occuring on the refuge are three to five bald eagles which are present during the fall and winter when waterfowl concentrate on the refuge. No nesting activity is known to be occurring.

INTRODUCTION

This fishery management plan was prepared by the fisheries assistance office, U.S. Fish and Wildlife Service, Natchitoches, Louisiana, and is an update of a previous plan. Information and management recommendations are based on materials provided by the refuge staff, the fishery assistance biologist and previous fishery management project reports. The purpose of this plan is to outline management recommendations which should not conflict with the primary objectives of the refuge which are waterfowl and timber management.

GOALS AND OBJECTIVES

Maintain balanced native sport fish populations in Bluff and Loakfoma Lakes and Ross Branch based on PSD values from electrofishing and angler catch data.

Subgoal A

Maintain desirable PSD range for bass of 30-60 and for bluegill of 20-60 (electrofishing data -- see Appendix II). Desirable ranges of PSD's from angler catch data are 20-60 and 50-80, respectively (Appendix II).

Fishery Habitat

BLUFF LAKE: This 1000 acre lake, averaging four feet in depth, was constructed in 1939 to serve as a feeding and resting site for waterfowl. The fishery was managed by personnel of Mississippi State University until 1943. The Mississippi Game and Fish Commission then took over management until 1979. During the state's management tenure, a $1.00 daily fishing fee was charged, and a boat rental concession was in operation. Both of these activities were discontinued when the

Service assumed management responsibility in 1979. Major flooding during the spring of that year, however, caused severe levee damage to Bluff, as well as the other two impoundments. Repair work was completed in 1981 with refilling and stocking occurring in the fall of that year. Water supply is Jones and Oktoc Creeks which flow through the lake.

Roughly 30 percent of the lake is heavily timbered in bald cypress with substantial amounts of smartweed, lotus and waterlily covering the open water section of the lake. The mats of smartweed concentrate gamefish to a remarkable degree. When electrofishing, the catch-per-unit-of-effort within these areas increases several fold as compared to other habitats within the lake. The abundance of grass shrimp, minnows, and other prey along with shade, cover, and cooler water undoubtedly all combine to attract large crappie and bass.

A situation presently being addressed by the refuge is an expanding lotus population. A virtually unmanageable problem is siltation, which is slowly filling the lake. Turbidity, however, is not a problem because the silt load is generally deposited at the receiving end of the lake which is heavily vegetated.

Two boat launches presently exist with plans to widen the most heavily used one and add another on Doyle Arm, a portion of the lake connected by a culvert under a refuge road.

LOAKFOMA LAKE: This 600 acre waterbody was constructed in 1964 by damming Loakfoma Creek. Water supply is the creek and surface runoff from approximately 7,700 acres of surrounding land. Like Bluff, this

impoundment was constructed for waterfowl. Water level is regulated by a stop-log structure which allows drainage into Loakfoma Creek. Average water depth is about four feet at full pool.

The shoreline is rimmed with a thick band of button bush, which also forms small islands in shallow water within the lake proper. Following levee damage and repair, Loakfoma was reflooded in the fall of 1980 and re-stocked. The lake has developed a bass population dominated by fish less than 12 inches long. A slot limit was initiated in 1987 to allow harvest of fish below 12 inches and above 15 inches. The lake was drained, however, in 1988 to repair a damaged water control structure and the effect of the slot limit could not be properly evaluated. The slot limit is being continued because there is still a high proportion of small bass in the population.

ROSS BRANCH: This 30 acre waterbody, constructed in 1963 is located on a tributary of Jones Creek and serves as a water supply for the Prisock moist-soil management area. Average water depth at full pool is five feet.

Spillway damage by the 1979 flood required lake drainage in 1980 for repairs which were completed in 1982. Initial fish stockings were carried out that fall and the following spring. Waters of this pool are soft and acid which hampers establishment of an algal bloom. The bass population is dominated by small bass and, like Loakfoma Lake, a slot limit is in place. Bands of black willow inhabit the upper portion of the lake but aquatic vascular vegetation is sparse.

Plan Element A - Bluff and Loakfoma Lakes and Ross Branch

Strategy IA - Surveys and Inventories

Task I - Sample fish populations annually.

Task II - Determine population structure and relative weights of sport fish through data collected by electroshocking.

Task III - Employ use of angler survey card (Appendix I) by interested bass clubs, local anglers, etc. for additional information on length frequencies of various sport fish species.

Task IV - Develop and maintain a fish species list.

Strategy IIA - Habitat Management

Task I - During annual sample taking, monitor pH, total hardness, conductivity and secchi visibility.

Task II - Annual drawdowns should be accomplished as late in the summer as waterfowl management will allow to maximize fish growing potential of the lakes.

Task III - Apply 2,4-D herbicide to areas in Bluff Lake infested with lotus as planned.

Strategy IIIA - Population Management

Task I - Use information obtained during electroshocking and through angler survey cards to plot length frequencies of largemouth bass, bluegill, redear sunfish, black and white crappie, and threadfin and gizzard shad.

Task II - Obtain PSD values for named species by accomplishing Task I above.

Task III - Follow shifts in population structure and, if deemed warranted, use harvest restrictions such as slot limits, minimum and maximum length limits, etc. to rectify unbalanced ratios of stock to quality-sized fish.

Strategy IVA - Protection

Task I - Utilize available law enforcement personnel to insure compliance with current regulations, especially slot limits, so that valid analysis of fish populations can be made.

Strategy VA - Public Use

Task I - Widen boat ramp on Bluff Lake as planned.

Task II - Construct boat ramp on Doyle Arm as planned.

Task III - Upgrade boat launch at Ross Branch.

Task IV - Continue allowing year round fishing access to the Noxubee River and other creeks, sloughs, and small ponds.

Strategy VIA - Research

Task I - Continue cooperative spirit with Mississippi State University (MSU) concerning use of refuge for various biology class field trips.

Task II - Continue allowing use of various waterbodies on the refuge as study areas for master's candidates in fisheries at MSU and coordinate research proposals with the fisheries assistance biologist.

Strategy VIIA - Education and Involvement

Task I - Continue to provide and update information in the refuge general leaflet and/or hunting and fishing regulations leaflet concerning fishing areas and seasons, boat launches, and regulations (whether state or special are in effect).

Task II - Promote special events such as National Fishing Week and National Fishing and Hunting Day.

FISHERY MANAGEMENT PLAN
SUMMARY

Noxubee National Wildlife Refuge

Brooksville, MS

Objectives	Strategies and Tasks	Start/End	Organizational Unit (Lead/Support)						
			WR	FAO	LE	HR	SE	RES	W&F
Maintain balanced native sport fish populations in Bluff and Loakfoma Lakes and Ross Branch based on PSD values from electrofishing and angler catch data. Subgoal A - Maintain desirable PSD range for bass and bluegill. Electrofishing: 30-60, largemouth bass; 20-60, bluegill. Angler: 20-60, largemouth bass; 50-80, bluegill.	Strategy IA - Surveys and Inventories								
	Task I - Sample fish populations annually.	annually	S	L					
	Task II - Determine population structure and relative weights of sport fish through data collected by electroshocking.	annually	S	L					
	Task III - Employ use of angler survey card for additional information on length frequencies of various sport fish populations.	annually	L	S					
	Task IV - Develop and maintain a fish species list.	as needed	S	L					
	Strategy IIA - Habitat Management								
	Task I - During annual sampling trip, monitor pH, total hardness, conductivity and secchi visibility.	annually	S	L					
	Task II - Annual drawdowns should be accomplished as late in the summer as waterfowl management will allow to maximize fish growing potential of the lakes.	annually	L	S					
	Task III - Apply 2,4-D herbicide to areas in Bluff Lake infested with lotus as planned.	as needed	L	S					

SUMMARY

Fishery Management Plan - Noxubee National Wildlife Refuge, Brooksville, MS

Objectives	Strategies and Tasks	Start/End	Organizational Unit (Lead/Support)						
			WR	FAO	LE	HR	SE	RES	W&F
Subgoal A, cont.	Strategy IIIA - Population Management								
	Task I - Use information obtained during electroshocking and through angler survey cards to plot length frequencies of large-mouth bass, bluegill, redear sunfish, black and white crappie, and threadfin and gizzard shad.	annually	S	L					
	Task II - Obtain PSD values for named species by accomplishing Task I above.	annually		L					
	Task III - Follow shifts in population structure and, if deemed warranted, use harvest restrictions such as slot limits, length limits, etc. to rectify unbalanced ratios of stock to quality-sized fish.	as needed	S	L					
	Strategy IVA - Protection								
	Task I - Utilize available law enforcement personnel to insure compliance with current regulations, especially slot limits, so that valid analysis of fish populations can be made.	annually	L	S	S				S
	Strategy VA - Public Use								
	Task I - Widen boat ramp on Bluff Lake.	1989/1990	L						
	Task II - Construct boat ramp on Doyle Arm.	1989/1990	L						
	Task III - Upgrade boat launch at Ross Branch.	1989/1990	L						
	Task IV - Continue allowing year round fishing access to Noxubee River, and other creeks, sloug' and small ponds.	annually	L						

SUMMARY

Fishery Management Plan - Noxubee National Wildlife Refuge, Brooksville, MS

Objectives	Strategies and Tasks	Start/End	Organizational Unit (Lead/Support)						
			WR	FAO	LE	HR	SE	RES	W&F
Subgoal A, cont.	Strategy VIA - Research								
	Task I - Continue cooperative spirit with Mississippi State University (MSU) concerning use of refuge for various biology class field trips.	as needed	L						
	Task II - Continue allowing use of water-bodies on the refuge as study areas for master's candidates in fisheries at MSU and coordinate research proposals with the fisheries assistance biologist.	as needed	L	S				S	
	Strategy VIIA - Education & Involvement								
	Task I - Continue to provide and update information in the refuge general leaflet and/or hunting and fishing regulations leaflet concerning fishing areas and seasons, boat launches, and regulations (whether state or special are in effect).	as needed	L	S					
	Task II - Promote special events such as National Fishing Week and National Fishing and Hunting Day.	annually	L						

Noxubee National Wildlife Refuge
Brooksville, MS

Fishery Management Implementation Schedule

Goals	Objectives	Tasks	Responsible Office	Date/Funding/FTE'S
Maintain balanced native sport fish populations in Bluff and Loakfoma Lakes and Ross Branch based on PSD values from electrofishing and angler catch data.	Subgoal A - Maintain desirable PSD range for bass and bluegill. Electrofishing: 30-60, bass; 20-60, bluegill. Angler: 20-60, bass; 50-80, bluegill.	Strategy IA - Surveys & Inventories		
		Task I - Sample fish populations annually.	FAO	annually/ 1000/ .02
		Task II - Determine population structure and relative weights of sport fish through data collected by electroshocking.	FAO	annually/ 1000/ .02
		Task III - Employ use of angler survey card for additional information on length frequencies of various sport fish populations.	WR	
		Task IV - Develop and maintain a fish species list.	FAO	included in Strategy IA, Task I
		Strategy IIA - Habitat Management		
		Task I - During annual sampling trip, monitor pH, total hardness, conductivity & secchi visibility.	FAO	included in Str. IA, Ta I
		Task II - Annaul drawdowns should be accomplished as late in the summer as waterfowl management will allow to maximize fish growing potential of the lakes.	WR	
		Task III - Apply 2,4-D herbicide to areas in Bluff Lake infested with lotus as planned.	WR	

Goals	Objectives	Tasks	Responsible Office	Date/Funding/FTE'S
Subgoal A, cont.		Strategy IIIA - Population Management		
		Task I - Use information obtained during electroshocking and through angler survey cards to plot length frequencies of large-mouth bass, bluegill, redear sunfish, black and white crappie, and threadfin and gizzard shad.	FAO	included in Str. IA, Task I
		Task II - Obtain PSD values for named species by accomplishing Task I above.	FAO	included in Str. IA, Task I
		Task III - Follow shifts in population structure and, if deemed warranted, use harvest restrictions such as slot limits, length limits, etc. to rectify unbalanced rations of stock to quality-sized fish.	FAO	included in Str. IA, Task I
		Strategy IVA - Protection		
		Task I - Utilize available law enforcement personnel to insure compliance with current regulations, especially slot limits, so that valid analysis of fish populations can be made.	WR	
		Strategy VA - Public Use		
		Task I - Widen boat ramp on Bluff Lake.	WR	
		Task II - Construct boat ramp on Doyle Arm.	WR	
		Task III - Upgrade boat launch at Ross Branch.	WR	
		Task IV - Continue allowing year round fishing access to Noxubee River, and other creeks, sloughs, and small ponds.	WR	

Fishery Management Implementation Schedule - Noxubee National Wildlife Refuge
Brooksville, MS

Goals	Objectives	Tasks	Responsible Office	Date/Funding/FTE'S
	Subgoal A, cont.	Strategy VIA - Research		
		Task I - Continue cooperative spirit with Mississippi State University (MSU) concerning use of refuge for various biology class field trips.	WR	
		Task II - Continue allowing use of waterbodies on the refuge as study areas for master's candidates in fisheries at MSU and coordinate research proposals with the fisheries assistance biologist.	WR	
		Strategy VIIA - Education & Involvement		
		Task I - Continue to provide and update information in the refuge general leaflet and/or hunting and fishing regulations leaflet concerning fishing areas and seasons, boat launches, and regulations (whether state or special are in effect).	WR	
		Task II - Promote special events such as National Fishing Week and National Fishing and Hunting Day.	WR	

SIDE 1

INFORMATION REQUESTED HERE
WILL HELP TO IMPROVE FISHING

Please fill out this card even if no fish are caught. A card should be completed by each fisherman. Notice that side 1 is for fish RETURNED to the pond, and side 2 is for fish permanently REMOVED from the pond.

NAME _____ PHONE ___/___/___

DATE _____ TIME STARTED _____ a.m., p.m

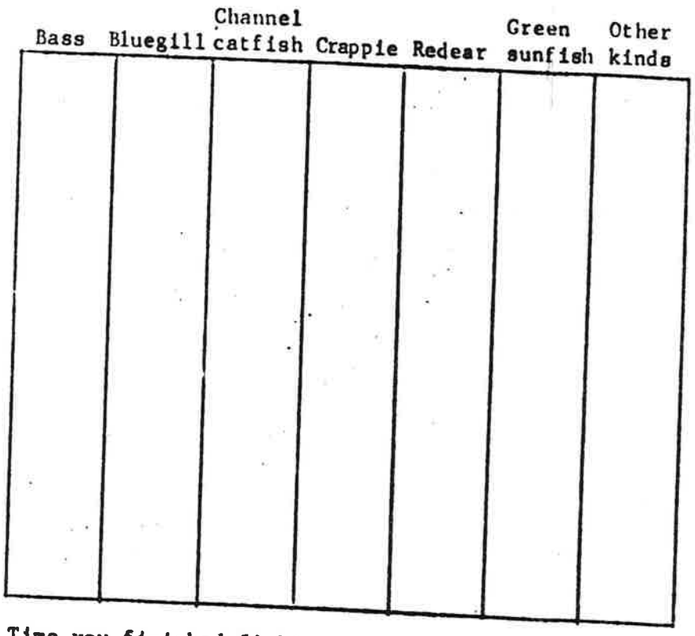
Record length of each fish RETURNED to pond.

Bass	Bluegill	Channel catfish	Crappie	Redear	Green sunfish	Other kinds

Fish REMOVED from pond should be recorded on side 2 when you are done fishing.

SIDE 2

Record length of each fish REMOVED from pond.



Time you finished fishing _____ a.m., p.m.

1. Today I fished primarily for (check one):
   bass ___; bluegill or other sunfish ___;
   crappie ___; channel catfish ___; anything ___.
2. I would rate fishing success today as (check one):
   excellent ___; good ___; fair ___; poor ___.
3. Please check here if no fish were caught ___.

THANK YOU FOR YOUR HELP

APPENDIX II

PROPORTIONAL STOCK DENSITY (PSD)
(1983, Anderson)

$$\text{Bass PSD Value} = \frac{\text{no.} \geq 12 \text{ inches}}{\text{no.} \geq 8 \text{ inches}} \times 100$$

PSD Range for a balanced Bass Population = 30 - 60%

$$\text{Sunfish PSD Value} = \frac{\text{no.} \geq 6 \text{ inches}}{\text{no.} \geq 3 \text{ inches}} \times 100$$

PSD Range for a balanced Sunfish Population = 20 - 50%

Summary of Harvest Recommendations

Based on percentage size distribution (PSD) of largemouth and bluegill caught by angling.

Angling PSD (%)

Largemouth bass	Bluegills	Harvest Recommendations
Less than 20	More than 80	Harvest more bass less than 12 inches long; protect bluegill by catch and release.
More than 60	Less than 50	Harvest more bluegills; protect all bass.
20 - 60	Less than 50	Harvest more bluegills; protect bass 12 to 16 inches long.
Less than 20	50 - 80	Harvest more bass less than 12 inches long; protect bass 12 to 16 inches long.
20 - 60	50 - 80	Balanced populations; maintain harvest routine; or protect bass 12 to 16 inches long.